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SCIENCE

FRIDAY, NOVEMBER 18, 1887.

THE CLOSING SESSION of the National Academy of Sciences, which was held Friday at Columbia College, was perhaps the most interesting of the series that occupied the greater part of last week. Unfortunately, in view of this fact, the attendance was smaller than on any of the previous days, as several of the members had accepted an invitation from Professor Edison to visit Menlo Park. The session opened with an interesting paper by Prof. W. P. Trowbridge. It has always been a puzzle how the muscular action necessary to keep birds on the wing so long as they often remain could be possible; and Professor Trowbridge explained the recent discovery by his son, which is that birds of prey and some others have the power to lock securely together those parts of the wing holding the extended feathers and corresponding to the fingers of the human hand. The action of the air on the wing in this condition extends the elbow, which is prevented from opening too far by a cartilage, and the wings may keep this position for an indefinite length of time, with no muscular action whatever on the part of the bird. While resting in this way, the bird cannot rise in a still atmosphere; but, if there be a horizontal current, it may allow itself to be carried along by it, with a slight tendency downward, and so gain a momentum by which, with a slight change of direction, it may rise to some extent, still without muscular action of the wings. The professor also believed it quite possible for a bird to sleep on the wing. In discussing this paper, Prof. J. S. Newberry said that he had once shot a bird which came slowly to the ground as if still flying, but reached it dead. He believed that it had died high in the air; but he had never been able to account for the manner of its descent till now, when he found an explanation in the statement of Professor Trowbridge. Professor Newberry read a paper on the future of gold and silver production. Beginning with gold, he said that he had spent a part of nearly every summer since 1855 among the mines of the West, and he believed that the production of the United States was past its maximum. The present annual production amounts to \$30,000,000. In the northern parts of the mountains of the West there is probably gold, and it may be hoped that a considerable contribution to the gold of the world will be made from this region. There are no important deposits of gold in Mexico. The western coast of South America, rich in silver, is poor in gold. It is likely that the ancient inhabitants practically exhausted the supply, and the images of this metal which they buried with the dead have been sought, with some success. The product of Europe is about \$30,000,000 annually, more than three-fourths of which is from the Ural Mountains. We need not expect any such quantities of gold as flooded the world from California, Australia, and New Zealand, but it may be hoped that the present production may be kept up for many years. The problems of silver-production for the future seem to lie wholly within our own country. There has been a production amounting to more than six thousand millions of dollars since the discovery of America, and it is likely to reach from forty to fifty millions annually for some years to come. The mines of Peru and Bolivia are the most famous in the world, and it is estimated that they have yielded \$2,493,268,800. Their yield has been comparatively little for many years. On Wednesday evening Mrs. Henry Draper gave a reception at her home, No. 271 Madison Avenue, to the members of the academy. The leading feature was an account given by Prof. E. C. Pickering, director of the Harvard Observatory, of the work in stellar photog-

raphy under the provisions of the Henry Draper Memorial Fund. A full list of the papers read is given in another column.

AT THE ANNUAL FALL MEETING of the trustees of Princeton, held Nov. 10, Dr. McCosh resigned the office of president, his resignation to take effect at the end of next term. In closing his annual report, Dr. McCosh said, "For several years past I have been sensitive as to whether I may not be continuing in my office to the detriment of the college. I am so far relieved by finding that no such effect has yet followed. Our entrance class this year, 179, is larger than ever it was before; as also our total number of students, 603. It was 264 when I came here, and this while we have gradually been raising our standard of scholarship. Thanks to our generous benefactors, our grounds and buildings, books and apparatus, have been doubled or trebled. But having been in your service for over nineteen years, and being several years above the threescore and ten, the time has come to look to my retiring from the presidency of the college. I see it clearly to be my duty to ask the board to accept my resignation at its next meeting in February, and appoint a successor to me, it being understood that I retain my office till the beginning of the third term. I leave the college in a healthy state, intellectually, morally, and religiously." Dr. McCosh was born in Ayrshire, Scotland, in 1811. Educated in the universities of Glasgow and Edinburgh, he early began to show signs of literary and philosophical talent of a high order. His first serious work, an essay on the Stoic philosophy, obtained for him the honorary degree of M.A., and he was ordained a minister of the Church of Scotland at Arbroath in 1835. In 1839 he removed to Brechin, and from that time he took a prominent part in the disputes which arose in connection with the disruption of the Scotch Church, and the organization of the 'Free Church,' which was effected in 1843. His next work to attract attention was 'The Method of the Divine Government, Physical and Moral,' which was a theological application of Sir William Hamilton's philosophy. In 1851 he was appointed professor of logic and metaphysics in Queen's College, Belfast, and wrote, in collaboration with Prof. G. Dickie, 'Typical Forms and Special Ends in Creation,' and 'Intuitions of the Mind,' which were followed by 'An Examination of Mill's Philosophy.' Dr. McCosh was elected president of the College of New Jersey at Princeton in 1868, and has held that office up to the present time. Among the works he has written in the mean time may be mentioned, 'The Laws of Discursive Thought,' 'Treatise on Logic,' 'Christianity and Positivism,' the 'Scotch Philosophy, Biographical, Expository, and Critical, from Hutcheson to Hamilton,' and his famous 'Reply to Professor Tyndall's Belfast Address.'

THE 'ACT OF GOD' AND THE RAILWAY-COMPANY.

SO far back that memory of man runneth not to the contrary — imported into the very earliest English jurisprudence from the Roman Code — was the theory of Nemesis, of the Inevitable, the Unavoidable. When it reached our motherland and Christian times, and clamored for recognition in the Common Law, our reverent Norman-Saxon lawyers, to be sure, called it the 'Act of God.' But it was the Stoic 'Fate' of the Roman — his 'Nemesis,' his 'Adrastea' — just the same; and the earliest English digests declared that 'the Act of God or of the public enemy' discharged all legal responsibility. In our day the doctrine is oftener laughed at than applied. A Western counsel for a railway-company, who, in defending an action for damages for haystacks destroyed by fire communicated from the company's locomotive, claimed that his

client had no control over the winds of heaven, speedily found himself out of court—his client should have used spark-arresters. But until a very recent date, courts of justice habitually saved time and routine labor by assuming accidents far less remote from their proximate causes than the distance between a haystack and a smoke-stack to be 'Acts of God;' though, indeed, a very recent English court, while recognizing the principle, declared that a shipwreck, to be a veritable act of God, must have happened in extremely bad weather.

But, though to-day in the United States the principle has all but disappeared from our digests, its existence is rather suggested by the somewhat startling fact, that, in all our recent chronicle of railway casualty (and I confine myself to the United States in this paper, because our safety appliances are invariably the latest, costliest, and most elaborate in the world, our corps of watchmen and care-takers the most numerous, and our estimates of the value of human life incomparably the largest), as a rule the simplest accident is the deadliest, and the utmost perfection of life-saving appliances (whose adoption saves in nine hundred and ninety-nine cases in the thousand) may yet turn out to be helplessness itself in the thousandth case when the calamity arrives: in other words, the disaster, when it comes, will be found to consist in the operation of some perfectly familiar law of nature (as of gravitation or inertia), set in motion by the simple oversight of some trained and trustworthy subordinate; which would have resulted from identical causes thirty centuries ago to the most primitive of conveyances equally as well as to our own limited expresses, with their air-brakes, vestibules, and coupler-buffers.

In examination of the history of railway-accidents in the United States, the physical conformation of the country should not be overlooked. As railways were first constructed among us, and had their formative days of operation in the Eastern States rather than among the flatlands and ordinarily easy grades of the Ohio valley, it was only natural that the bulk of experiment, mismanagement, error, and fatality, should have been expended on our Atlantic slopes. The period of the railway in the United States is yet one very insignificant in point of years. To-day, in 1887, the maps of our territory of greatest railway-development have Lake Michigan and the Mississippi, instead of the Atlantic Ocean, for their east. But by the time that railway-construction had begun to extend westwardly from those boundaries, those greatest insurances of safety—the air-brake, the coupler-buffer, the steel rail, the improved means of communication between the engineer, conductor, and his crew, which had been slowly wrought out in the East—had come into practical use. Hence it is that the Pacific railroads, though spanning gorges, climbing summits, and surmounting problems of construction to which the achievements of our Atlantic slope railroads are moderate, have no such records of manslaughter and destruction as we find in the records of Eastern rail-transportation. At present every American railway is equipped—is obliged by law to be equipped—with the last improvement in safety-insuring devices, not only for the convenience of the passenger, but for the safety of the employee against his employer as well as against fellow-employee. And it is an amenity to the credit of the railway system (which ought not to be lost sight of in these days when wage-workers are taught to look upon any thing incorporated as their deadliest foe) that it has introduced into the common law of the land the principle that an employer's duty to his employees is only discharged by furnishing him the safest tools for his work which the strides of science have devised.

Until within a very few months, these strides of science seemed to have happily abolished—in the United States—the great railroad-disasters of the past. Since the frightful catastrophe at Carr's Rock on the Erie Railway of twenty years ago, science and experience have rendered the giddy curves and bold escarpments of its Delaware division as safe as the tangents crossing an Iowa prairie. The Angola and Ashtabula terrors on the Lake Shore Railway wound up practically the list for that line; while, had it not been for a phenomenal piece of silly and unaccountable carelessness at Spuyten Duyvel (when Mr. Wagner, an inventor of parlor-car conveniences, was crushed to death in one of his own coaches), the New York Central would have closed up its own perspective of great calamities at New Hamburg, something in

the neighborhood of fifteen years ago. But this fifteen years of wonderful immunity from great railway-disaster—most wonderful when we consider that it corresponds with an era of railway-building in the United States unparalleled in the history of human industry—has been brought to a termination by a rapid succession of calamities, grouped into a period of ten months, which, in point of loss of human lives (and no other point is worth considering), are, if not the most terrible in railway annals, yet fall little in horror below the Wigan slaughter, or the annihilation at Tay Bridge, of the multiple horrors of which (analogous to those of shipwreck and railwreck combined) no living tongue shall ever tell the story. These five occurred during the first ten months of the present year, (1) on the Baltimore and Ohio Railroad at Republic, Jan. 4, 1887; (2) on the Central Vermont Railroad at White River, Vt., Feb. 11; (3) on the Boston and Providence Railroad at Forest Hills, March 14; (4) on the Toledo, Peoria, and Western Railroad at Chatsworth, Aug. 10; and (5) at Kout's Station on the Chicago and Atlantic Railway, Sept. 12 of the present year. These five are, I think, remarkable not only because breaking in upon the long immunity, but because upon examination it will, I think, be found that they were each and all due, not to any defect of machinery, signals, or other mechanical appliances which the corporation could have supplied, or to any defective or careless management, but to those unaccountable omissions of trained minor servants to perform a perfunctory detail of their routine work—a detail which it was their second nature to perform—which it would have ordinarily required a physical effort for them *not* to perform, or to have kept them from performing; that is to say (for it is difficult to exactly formulate it in words), an instantaneous mental incapacity on the part of a trained workman or care-taker, over which laws, rules, and incorporations have no control, and against the possibility of which neither hope of reward nor fear of loss or punishments can afford any defence or protection whatever. They all occurred on perfectly equipped roads, and from the simplest natural causes. Each of the accidents might have happened to the rudest contrivance of primeval or prehistoric man,—to the cart which used the section of a tree-trunk for a central wheel, or to the hollowed tree-trunk which itself formed a means of water-transportation, as will appear from their recapitulation.

The Republic accident was in this wise: a freight-train, which had ample time to make a run of some dozen miles to get out of the way of a through express coming in an opposite direction, which had made that run easily every night for years, for once failed to accomplish it. All the mechanical appliances and motive power of the train were in perfect order; its crew were old servants of the company. But the weather was exceptionally cold, the water in the tank of the engines was all but congealed, and the crew of the freight-train found themselves encroaching on the time of the express. Here was not only no novel situation, but, on the contrary, perhaps the simplest which can occur in any railway management. There was no emergency to meet. Probably not an hour passes in a day but that, somewhere in the vast railroad operations of the country, the case is paralleled. But here at Republic, on the night of the fourth day of January, 1887, the hand sent ahead with the signal failed to carry it: two trains met. The old catch problem of the irresistible force meeting the immovable body demonstrated itself; namely, the trains were destroyed, and twenty human beings lost their lives.

Just a month later, Feb. 5, came the disaster at White River. A night express thundered upon a bridge, which was supposed to be properly inspected. Every mechanical portion of the train was working as it should; every servant of the company was at his post; nevertheless, the locomotive left the rails instead of following them; the express-train was plunged to the frozen surface of the river fifty feet below; and, of its three hundred passengers, thirty-two never breathed again, or were roasted in slow agony from burning *débris* upon a floor of ice. Every bridge on every railroad-line in the nation is ordered to be watched. A corporation must act by its agents. This bridge had probably been hourly inspected for years, but somebody had failed to inspect it on the fifth day of February, 1887. Another month went by, and on the morning of the 14th of March a packed train on the Boston and Providence Railroad of three hundred mechanics and working-women was

moved into Boston for the day's business. Somebody had failed to report or to discover a flaw in the iron-work of a bridge at a point called Forest Hills. The locomotive followed the rails. Every thing upon the train was in perfect order; no appliance in the company's power to provide was lacking; but the bridge sank. The entire train except two rear cars was piled up in kindling-wood in a defile made by a passing road below; and from the undistinguished mass forty persons were drawn out dead. Four months of absence of great calamity by rail was then to succeed. But on the evening of the 10th of August an excursion party, gathered at Peoria and other points in Illinois, was to be carried to Niagara Falls. There were sixteen cars loaded with excursionists, and two engines were needed to draw them. The ordinary rules were observed, and due notice of the extra movements of such an unusual train was duly wired ahead for the guidance of watchmen and track-walkers. All went regularly; but it seems that a side-fire had been kindled on the right of way for clearing-up purposes, and that some track-walker whose duty it was to watch it had allowed it to communicate to the beams of the wooden bridge at or near Chatsworth. The train reached the bridge, but the bridge was already disabled by fire. It sank as did the one at Forest Hills, and eighty-five passengers were killed, — a most unprecedented death-list for an American railway-accident. Compared to the above, the fifth of these fast-recurring disasters seems almost dwarfed, and yet it was the most wonderful — from the standpoint of our present examination — of all. An engine drawing an express passenger-train on the Chicago and Atlantic Railway became disabled by the breaking of an eccentric strap. The engineer hauled up at a water-tank for repairs. A freight-train which followed, relying upon the schedule which the first train should ordinarily make, ran into the rear of the train with the disabled engine. Nine persons only were killed, — a small list compared with those we have previously noted. But doubtless it is as terrible to the victim to be killed in a list of nine as in a list of eighty. It was the story of the Republic disaster over again. Some brain had failed to do the regular act which it had performed for years as regularly as clock-work.

Now here, in less than nine months, one hundred and eighty-six lives, all precious to their owners if to nobody else, are sacrificed. Nobody but the claim agents of the corporations can ever know the number of wounded and maimed (nor even they, since many of those who escape do not care to press their undoubted claims), and the stockholders of the unfortunate corporation do not care to advertise the dead loss of material which it costs in cash to replace its ruined rolling-stock and transported material, lest the newspapers of the country dilate upon the preference shown for income over flesh and blood, and lash the popular dislike of corporations into fury with the stereotype with which every railway-accident fills our admirable press. But allowing four to one, — a minimum allowance, — nearly eight hundred more human beings have suffered a loss of limb or extreme physical pain, and several hundred thousands of dollars' worth of direct expenses incurred, for every one of these accidents, which should never, in the ordinary course of human procedure, have happened at all.

I say, should never have happened; but where shall the responsibility be placed? By law it is placed, and rightly, so far as human laws go, upon the railway-companies. But every railway-officer knows that the penalty his company suffers for such accidents as the five above described is exemplary, — a vindication only, so far as the companies themselves are concerned. That they have done, were doing at the time the accident happened, all that experience and science had taught them how to do, or that their professional or expert brethren employed in the same industry could have done under like circumstances, they know, and every railroad-man in the country knows, perfectly well. But the railway-official also knows very well, however, and realizes very submissively, that for these accidents he will be held to answer, and *not* before a jury of experts, or of his peers. The newspapers in no one of the above instances fail to ascribe these accidents to the 'greed of corporations.' The 'greed of corporations,' to be sure, is only another name for the duty of every corporation to pay dividends, if they can; and doubtless, were there no such duty or no such chance of payment, there would be no railroads, from the simple disinclination of ordinary

mortals to invest money in costly enterprises without hope of return or increment. But waiving that consideration, certainly it is hedging on the superfluous and the elementary to say that no railway-company courts accidents; that, no matter how large any individual loss by reason of the casualty may be, the company (that is to say, its stockholders collectively) must be the largest losers of all. When Sir James Coke said that corporations had no souls, he did not utter an epigram: he simply stated a fact. A corporation has no sentiments: it is simply put together for business purposes, because a number of individuals see in association the means of investing in a lawful industry too heavy for any one of them to singly handle. An attempt to earn dividends is properly described as 'greed,' of course. But what reader of newspaper denunciation pauses to subtract from any particular year's 'greed,' of any particular corporation, the million of dollars or less that a great disaster like that at Chatsworth or Forest Hills draws out of a company's treasury? Whatever the present state of clamor against corporations may develop, it is at least apparent, from considerations of pure 'greed,' that a railway-corporation is not a Moloch, or a contrivance incorporated for the purpose of burning or mutilating human beings, or crushing their bones, or mangling their limbs. Philares is said to have built a hollow bronze ox in which to roast his subjects for fun, and the druids to have made wicker cages in which to burn as many living babies as possible for economy's sake. But bronze oxen and wicker cages are comparatively inexpensive, and there were no courts handy in which damages could be recovered by the survivors. Locomotive engines and Pullman coaches are, however, rather costly receptacles in which to holocaust passengers. In spite of newspaper declamation, is it not self-evident that no railway-company gloats over the ruin caused by an accident upon its line?

To return to the five accidents above mentioned. In not one of them does it appear from the reports to the company — the newspaper accounts, or even the findings of the local coroner's jury (a class of valuable material which is not apt to be over complimentary to the railway-company) — that any of the mechanical agencies — operating-gear, engines, couplings, air-brakes, signals, wheels of the trains wrecked — were old, superannuated, or in bad repair; that the track was in bad condition; or that ordinary wear and tear had been allowed to remain unmet or exceeded. The utmost that can be said was, that, out of some three millions of men employed in the service of the railway-companies of the United States, five seem, for some utterly unaccountable reason, to have each failed in his duty of a moment, and that that moment in which he failed happened in the course of chance to be the supreme and crucial moment respectively in the lives of some two hundred human beings. It is too late in the day to call these failures, perhaps, 'Acts of God,' but what else are they? They are not the fault of the company. The company has no control over the minds of their servants. It could, indeed, negatively control their minds by so overworking them that nature refused longer to perform its functions. And for the safety of the community we think the law ought to take cognizance of a company which overworked its employees, and hold it to the same responsibility in that case as in cases where the company furnished dangerous conveyances to its patrons, or old, worn, and imperfect machinery to its servants. But in the five cases above selected there is no such allegation. The men sent out to warn an approaching train at Republic and at Kout's Station for once omitted their routine duty. The track-walker at Chatsworth forgot the bonfire kindled on the right of way. The bridge-inspector at White River and at Forest Hills failed to discover, or, discovering, to report, a flaw in a girder or a brace. To say that the companies failed to provide proper persons to perform these duties, is to say that they were willing to take the risk of losses running into millions rather than spend from five to a hundred dollars in cash. And most people who know any thing, know that (newspaper reporters and leader-writers, even, to the contrary) that is not the way railroads are managed in the United States, at all events. And we may add, that, had it been, the above enumerated accidents would not have waited until the year of grace 1887 to have transpired. The railroad-company, then, is at the mercy of its employees. I will not cite figures, because figures can be 'cooked.' But if anybody will sit down and compute the millions spent annu-

ally—not on public grounds, but for the purely selfish purpose of avoiding expensive accidents (that is, in self-preservation)—by the railways of the United States, in premiums for new inventions, in training-schools and shops for the education of its servants and the development of improvements, for the purchase of the latest devices for the saving of life and property, he will find his command of figures taxed to express the aggregate result. And if he will remember the number of courts and lawyers in this great country of ours, and the general gusto with which juries mulct railway-companies, he will not wonder, I think, that science cannot move fast enough in devising improvements to be utilized in the physical management of railways. The presumptive margin of profit in railway-operation is small enough as it is; but when the recurrence of such accidents as those at Republic, at White River, at Forest Hills, at Chatsworth, and at Kout's Station are admitted into the forecast, it is apt to produce a rather considerable shrinkage in the prospect, or in the temptation of stockholders to build more railroads.

Congress has lately established a bureau at Washington for the filing of railway-schedules, and for discovering what, if any, 'long hauls' and 'short hauls' can possibly be "under substantially similar circumstances and conditions." What public benefit this bureau may become to the public, it remains to be demonstrated. But, if the establishment of another bureau or commission to devise a means for supplying railway-companies with infallible employees were contemplated by the government, the government's good intentions, at least, could not well be questioned. Of the three millions of railway-employees in this nation, the percentage who do not do their duty is too microscopical for expression in decimals; but the railway-industry happens to be one in which an invisible percentage of carelessness produces enormously visible calamitous results; that is the price we pay for being carried back and forth to our business at five miles in ten minutes instead of five miles in an hour. But before the absolutely infallible employee is found, some eminent counsel of a railway-company may yet be bold enough to claim, that, since railroad-companies cannot take their brakemen and track-walkers from the class of the community which produces Sumners, Websters, and Conklings, the unknown mental processes which sometimes lead a brakeman or a track-walker, from causes entirely and subjectively mental, to happen to think of something else than his routine duty, ought to discharge a corporation which has no soul—if not from pecuniary damages for loss of life, limb, or property it has no agency in procuring, at least from newspaper declamation, and charges of sacrificing its passengers and patrons to mere 'greed.' Since, however we may explain it, it happens to be one of the most persistent of truths that accidents are of more frequent occurrence upon bankrupt or non-dividend paying than upon solvent and dividend paying railroads, one might say, logically speaking, that the 'greed' of a railway-company was a public security rather than a danger.

There is an apparent moral to be drawn from these records of casualty, which, from one point of view, perhaps, is safe enough. We may say, and say with great truth, that no achievement of applied science can be substituted for human watchfulness and care, but only for human skill. But to this there would be exceptions. The automatic hay-press, which rams and packs and binds not only, but debouches the completed ball in time to pack another in the place from which that ball is debouched; the Hoe printing-press, which counts the sheets it prints; and hundreds of others,—are watchfulness personified (and I am told that there are mechanics employed in the most delicate processes of watch-making which are said even to correct a chance misplacement of the material to be worked upon); but, since the operation of none of these is occupied with the transportation of human beings, should these automata fail, no lives are lost, and no public outcry awakened. The better statement is, I think, that no machine can counteract human wilfulness or neglect. The machine can only do the share of work allotted it. If the man fails in his, no accuracy of invention can suffice. A dial may register the failure of a watchman to visit a certain point so many times a night, and tell its unalterable tale in the morning. But, where a train of human freight rushes on to death and disaster, death and disaster tell the tale, upon the instant of the dereliction, and when it is too late to correct the fault or supply the omission. And the public scarifies with its denuncia-

tion the owners of the machine, and not the man or men who ought to have cleared its track but did not.

Everybody must trust somebody, corporations must trust everybody they employ: nay, more, the railway-company must not only trust everybody, but it is at the mercy of every track-walker on its line; and, worse than that, every passenger that a railway transports, every pound of freight it moves, is at his mercy too. Should that track-walker's eye be turned from an obstruction or overlook a detail, the eternal vigilance of every other servant of the company is worse than useless. The crash must come, and all the sooner because the machinery which moves the train is of the latest and best, and the coaches the completest and most luxurious, that human ingenuity has devised. Penalties, threats, the prospect of rewards, alike fail to make the man do his duty, or to prevent his forgetfulness or wilful absence of mind or body at a crucial point, or the intellectual hiatus of a moment which causes his hand to forget once in a half a million of times the required act which it is quite his second nature to do at all the other times. What is it? Is it an 'Act of God?' Is it inevitable necessity, or is it Nemesis?

The physical perils of the sea appear to have been already overcome. But the peril of panic remains, that no human ingenuity can prevent, and no human discipline, however it may foresee, control. The wheelsman of the 'Ville de Havre' had watched a vessel steering towards them for hours in a clear night; but when that vessel was about to crush the great steamer, the very thought of the monumental magnitude of the approaching peril paralyzed that wheelsman's brain, and the brain-paralysis steeled his hand, and he could not turn his wheel the few points that meant safety to a priceless human freight. What is there to provide against here? Shall we still preserve the antique phrase 'Act of God,' or merely say that it is fate or luck? Call it what we will, there is yet, it would seem, an element in all mundane affairs for which nothing human can invent an antidote or remedy, and which possibly should relieve us, under our human laws, of the responsibility. Whether or not mere human framers of human laws ever devise a statute for the emergency, of one thing, however, we can, I think, be sure enough; namely, if a relief from this 'Act of God' should ever come, it will be because science, and not the reporters, nor yet the leader-writers of our daily newspapers, have grappled with the problem. Every thing except the human brain, the human brain appears to have conquered or to be in a fair way to conquer. But to go outside of itself to control itself—that, it seems, so far, to have been unable to do.

APPLETON MORGAN.

SOUND-BLINDNESS.

THE phenomena of color-blindness are well known, and have been carefully investigated. We know that some persons can see to great distances, discern minute objects, enjoy works of art, and yet are unable to distinguish certain colors. Physiologists, and especially psychologists, have also found that there is a similar series of phenomena to be observed in connection with the sense of hearing. If a word were coined to describe these phenomena, it would naturally be 'sound-deafness,' but many who have written on this subject seem to prefer the term 'sound-blindness.'

A writer in the London *Journal of Education* uses the term 'sound-blindness,' and seems to have come to the subject from a pedagogic standpoint. He states that the difficulties which some persons have in learning to spell and in learning how to pronounce foreign languages suggested to him the possibility of the existence of such a thing as sound-blindness,—an inability to distinguish particular shades of sound, arising from some organic defect in the ear which is distinct from deafness, as that term is commonly understood.

The writer in question noticed that a small boy, in writing down a line of poetry which he had learned by heart, had spelled the word 'very' 'voght.' When some experiments were tried, it was found that the boy could hear no difference between 'very,' 'perry,' and 'polly,' and yet he was not deaf. The boy in question had great difficulty in learning to read, and, on inquiry being made, many teachers were found who testified to the fact that it is quite a common thing to meet with children who are very slow in learning to read precisely, because sounds, different to the teacher, were not different to them. It was also found, that, when a class of